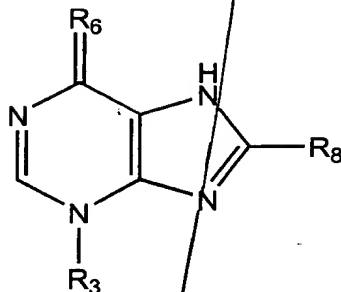


What is claimed is:

1. A pharmaceutical composition comprising a compound of the formula:



wherein;

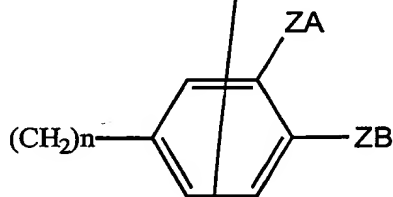
$R_6 = S$ or O

R_3 is selected from the group consisting of $C_1 - C_8$ linear or branched alkyl; $C_2 - C_8$ linear or branched alkene; $C_2 - C_8$ linear or branched alkyne; C_{3-8} cycloalkyl; Q ; and K ;

R_8 is selected from the group consisting of $C_1 - C_8$ linear or branched alkyl; $C_2 - C_8$ linear or branched alkene; $C_2 - C_8$ linear or branched alkyne; C_{3-8} cycloalkyl; Q ; and K ;

wherein

Q has the general formula:



wherein;

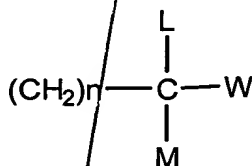
$n = 0$ or 1 ;

Z = a bond, CH₂, NH, O or S;

A and B can form a ring by adding 1-3 CH₂ groups when Z = CH₂, NH, O or S; and

A and B are not in a ring when Z = a bond, wherein A and B are independently selected from the group consisting of hydrogen; halogen; C₁ - C₈ alkyl; C₁ - C₈ alkoxy; C₃ - C₈ cycloalkyl; C₃ - C₈ cycloalkoxy; hydroxy; phenyl; benzyl; and benzyloxy; wherein said phenyl, benzyl and benzyloxy are optionally substituted with halogen, C₁ - C₈ alkyl, C₁ - C₈ alkoxy, C₃ - C₈ cycloalkyl, C₃ - C₈ cycloalkoxy and hydroxy;

K has the general formula:



wherein;

n = 0 or 1;

L and M are independently selected from the group consisting of hydrogen and methyl;

W is selected from the group consisting of Q; hydroxy; benzyloxy optionally substituted with halogen, C₁ - C₈ alkyl, C₁ - C₈ alkoxy, C₃ - C₈ cycloalkyl, C₃ - C₈ cycloalkoxy and hydroxy; aryl; heteroaryl; and a heterocyclic ring;

and pharmaceutically acceptable salts thereof.

2. The pharmaceutical compound of claim 1 wherein R₃ is benzyl.

3. The pharmaceutical compound of claim 1 wherein R₃ is benzyl substituted with an alkoxy and a cycloalkoxy group.

4. The pharmaceutical compound of claim 1 wherein R₃ is benzyl substituted with benzyloxy.

5. The pharmaceutical compound of claim 1 which is selected from the group consisting of:

3-methyl-hypoxanthine;

3-butyl-hypoxanthine;

3-butyl-thiohypoxanthine;

3-ethyl-hypoxanthine;

3-ethyl-thiohypoxanthine;

3,8-diethyl-hypoxanthine;

3,8-diethyl-thiohypoxanthine;

3-ethyl-8-cyclopropyl-hypoxanthine;

3-ethyl-8-cyclopropyl-thiohypoxanthine;

3-propyl-hypoxanthine;

3-hexyl-hypoxanthine;

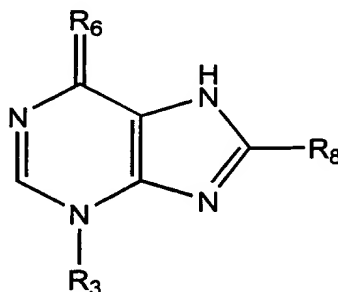
3-hexyl-thiohypoxanthine;

3-benzyl-hypoxanthine;

3-benzyl-thiohypoxanthine;
3-(4-methyl-butyl)-hypoxanthine;
3-(4-methyl-butyl)-thiohypoxanthine;
3-(2-methyl-butyl)-hypoxanthine;
3-(2-methyl-butyl)-thiohypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-hydroxy-1-methyl-ethyl)-hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-methyl-ethylene)-hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-
hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(benzyloxymethyl)-hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-(4-methoxybenzyloxy)-1-methyl-ethyl)-
hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-(4-fluorobenzyloxy)-1-methyl-ethyl)-
hypoxanthine;
3-(3-benzyloxy-4-methoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-hypoxanthine;
3-(3-4-dimethoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-hypoxanthine;
3-(3-benzyloxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-hydroxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-4-dimethoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(1,3-benzodioxole-5-methyl)-8-(1-methyl-ethyl)-hypoxanthine;
 3-(4-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
 3-(3-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
 3-(4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
 3-(3-4-dimethoxy-benzyl)-8-(1-(4-fluorobenzyloxy)-1-methyl-ethyl)-hypoxanthine;
 and pharmaceutically acceptable salts thereof.

6. A method of treating a mammal suffering from a disease state selected from the group consisting of asthma, allergies, inflammation, depression, dementia and disease states associated with abnormally high physiologic levels of cytokine, comprising administering an effective amount of a compound of the formula:



wherein;

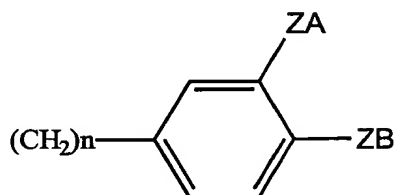
$R_6 = S \text{ or } O$

R_3 is selected from the group consisting of $C_1 - C_8$ linear or branched alkyl; $C_2 - C_8$ linear or branched alkene; $C_2 - C_8$ linear or branched alkyne; C_{3-8} cycloalkyl; Q; and K;

R₈ is selected from the group consisting of H, C₁ – C₈ linear or branched alkyl; C₂ – C₈ linear or branched alkene; C₂ – C₈ linear or branched alkyne; C₃₋₈ cycloalkyl; Q; and K;

wherein

Q has the general formula:



wherein;

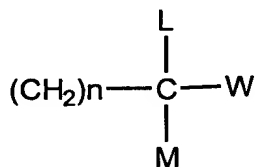
n = 0 or 1;

Z = a bond, CH₂, NH, O or S;

A and B can form a ring by adding 1-3 CH₂ when Z = CH₂, NH, O or S; and

A and B are not in a ring when Z = a bond, wherein A and B are independently selected from the group consisting of hydrogen; halogen; C₁ – C₈ alkyl; C₁ – C₈ alkoxy; C₃ – C₈ cycloalkyl; C₃ – C₈ cycloalkoxy; hydroxy; phenyl; benzyl; and benzyloxy; wherein said phenyl, benzyl and benzyloxy are optionally substituted with halogen, C₁ – C₈ alkyl, C₁ – C₈ alkoxy, C₃ – C₈ cycloalkyl, C₃ – C₈ cycloalkoxy and hydroxy;

K has the general formula:



wherein;

$n = 0$ or 1 ;

L and M are independently selected from the group consisting of hydrogen and methyl;

W is selected from the group consisting of Q; hydroxy; benzyloxy optionally substituted with halogen, $C_1 - C_8$ alkyl, $C_1 - C_8$ alkoxy, $C_3 - C_8$ cycloalkyl, $C_3 - C_8$ cycloalkoxy and hydroxy; aryl; heteroaryl; and a heterocyclic ring;

and pharmaceutically acceptable salts thereof.

7. The method of claim 6 wherein R_3 is benzyl.

8. The method of claim 6 wherein R_3 is benzyl substituted with an alkoxy and a cycloalkoxy group.

9. The method of claim 6 wherein R_3 is benzyl substituted with benzyloxy.

10. The method of claim 6 which is selected from the group consisting of:

3-methyl-hypoxanthine;

3-butyl-hypoxanthine;

3-butyl-thiohypoxanthine;

3-ethyl-hypoxanthine;

3-ethyl-thiohypoxanthine;

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3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-(4-methoxybenzyloxy)-1-methyl-ethyl)-
hypoxanthine;

3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-(4-fluorobenzyloxy)-1-methyl-ethyl)-
hypoxanthine;

3-(3-benzyloxy-4-methoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-hypoxanthine;

3-(3-4-dimethoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-hypoxanthine;

3-(3-benzyloxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(3-hydroxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(3-4-dimethoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(1,3-benzodioxole-5-methyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(4-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

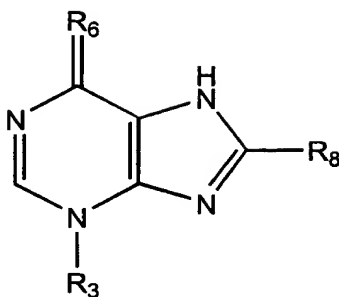
3-(3-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(3-4-dimethoxy-benzyl)-8-(1-(4-fluorobenzyloxy)-1-methyl-ethyl)-hypoxanthine;

and pharmaceutically acceptable salts thereof.

11. A compound of the formula:



wherein;

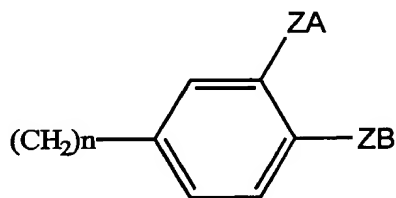
R₆ = S or O

R₃ is selected from the group consisting of C₁ – C₈ linear or branched alkyl; C₂ – C₈ linear or branched alkene; C₂ – C₈ linear or branched alkyne; C₃₋₈ cycloalkyl; Q; and K;

R₈ is selected from the group consisting of H, C₁ – C₈ linear or branched alkyl; C₂ – C₈ linear or branched alkene; C₂ – C₈ linear or branched alkyne; C₃₋₈ cycloalkyl; Q; and K;

wherein

Q has the general formula:



wherein;

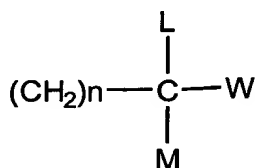
n = 0 or 1;

Z = a bond, CH₂, NH, O or S;

A and B can form a ring by adding 1-3 CH₂ when Z = CH₂, NH, O or S; and

A and B are not in a ring when Z = a bond, wherein A and B are independently selected from the group consisting of hydrogen; halogen; C₁ - C₈ alkyl; C₁ - C₈ alkoxy; C₃ - C₈ cycloalkyl; C₃ - C₈ cycloalkoxy; hydroxy; phenyl; benzyl; and benzyloxy; wherein said phenyl, benzyl and benzyloxy are optionally substituted with halogen, C₁ - C₈ alkyl, C₁ - C₈ alkoxy, C₃ - C₈ cycloalkyl, C₃ - C₈ cycloalkoxy and hydroxy;

K has the general formula:



wherein;

n = 0 or 1;

L and M are independently selected from the group consisting of hydrogen and methyl;

W is selected from the group consisting of Q; hydroxy; benzyloxy optionally substituted with halogen, C₁ - C₈ alkyl, C₁ - C₈ alkoxy, C₃ - C₈ cycloalkyl, C₃ - C₈ cycloalkoxy and hydroxy; aryl; heteroaryl; and a heterocyclic ring;

provided that when R₃ is methyl, R₈ is not hydrogen;

except for compounds wherein R₃ and R₈ are the same or are different and are selected from hydrogen, C₁₋₈ alkyl which is unbranched or branched and unsubstituted or substituted

with OH, alkoxy, CO₂H, =NOH, =NOCONH₂, or =O; C₃₋₈ cycloalkyl which is unsubstituted or substituted with OH, alkoxy, cycloalkoxy, halogen, haloalkyl, CO₂H, =NOH, =NOCONH₂, or =O; C₄₋₈ cycloalkylalkyl wherein the cycloalkyl portion is unsubstituted or substituted with one or more OH, alkoxy, cycloalkoxy, CO₂H, =NOH, =NOCONH₂, or =O; aryl which is unsubstituted or substituted with one or more Cl, NH₂, alkylamino, dialkylamino, amido, C₁-C₈ alkylamido, C₁-C₃ dialkylamido, OH, alkoxy, C=NOH, C=NOCONH₂, C₁-C₃ alkyl, phenyl or benzyl; ar(C₁₋₄)alkyl, optionally substituted with halogen, alkoxy or cycloalkoxy; heterocyclyl, heterocyclyl (C1-4 alkyl) and heteroaryl;

except for compounds wherein

R₃ and R₈ are the same or are different and are selected from hydrogen, C₁₋₈ alkyl which is unbranched or branched and unsubstituted or substituted with OH, alkoxy, CO₂H, =NOH, =NOCONH₂, or =O; C₃₋₈ cycloalkyl which is unsubstituted or substituted with OH, alkoxy, cycloalkoxy, halogen, haloalkyl, CO₂H, =NOH, =NOCONH₂, or =O; C₄₋₈ cycloalkylalkyl wherein the cycloalkyl portion is unsubstituted or substituted with one or more OH, alkoxy, cycloalkoxy, CO₂H, =NOH, =NOCONH₂, or =O; aryl which is unsubstituted or substituted with one or more Cl, NH₂, alkylamino, dialkylamino, amido, C₁-C₈ alkylamido, C₁-C₃ dialkylamido, OH, alkoxy, C=NOH, C=NOCONH₂, C₁-C₃ alkyl, phenyl or benzyl; ar(C₁₋₄)alkyl, optionally substituted with halogen, alkoxy or cycloalkoxy; heterocyclyl, heterocyclyl (C1-4 alkyl) and heteroaryl, with the exception of the following species:

3-butyl-hypoxanthine;

3-butyl-thiohypoxanthine;

3-ethyl-hypoxanthine;

3-ethyl-thiohypoxanthine;
3,8-diethyl-thiohypoxanthine;
3-ethyl-8-cyclopropyl-hypoxanthine;
3-ethyl-8-cyclopropyl-thiohypoxanthine;
3-propyl-hypoxanthine;
3-hexyl-hypoxanthine;
3-hexyl-thiohypoxanthine;
3-benzyl-hypoxanthine;
3-benzyl-thiohypoxanthine;
3-(4-methyl-butyl)-hypoxanthine;
3-(4-methyl-butyl)-thiohypoxanthine;
3-(2-methyl-butyl)-hypoxanthine;
3-(2-methyl-butyl)-thiohypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-hydroxy-1-methyl-ethyl)-hypoxanthine;
3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-hydroxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-4-dimethoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(4-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

and pharmaceutically acceptable salts thereof..

and pharmaceutically acceptable salts thereof.

12. The compound of claim 11 wherein R_3 is benzyl.

13. The compound of claim 11 wherein R_3 is benzyl substituted with an alkoxy and a cycloalkoxy group.

14. The compound of claim 11 wherein R_3 is benzyl substituted with benzyloxy.

15. The compound of claim 11 which is selected from the group consisting of:

3-butyl-hypoxanthine;

3-butyl-thiohypoxanthine;

3-ethyl-hypoxanthine;

3-ethyl-thiohypoxanthine;

3,8-diethyl-hypoxanthine;

3,8-diethyl-thiohypoxanthine;

3-ethyl-8-cyclopropyl-hypoxanthine;

3-ethyl-8-cyclopropyl-thiohypoxanthine;

3-propyl-hypoxanthine;

3-hexyl-hypoxanthine;

3-hexyl-thiohypoxanthine;
 3-benzyl-hypoxanthine;
 3-benzyl-thiohypoxanthine;
 3-(4-methyl-butyl)-hypoxanthine;
 3-(4-methyl-butyl)-thiohypoxanthine;
 3-(2-methyl-butyl)-hypoxanthine;
 3-(2-methyl-butyl)-thiohypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-hypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-hydroxy-1-methyl-ethyl)-hypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-methyl-ethylene)-hypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-
 hypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(benzyloxymethyl)-hypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-(4-methoxybenzyloxy)-1-methyl-ethyl)-
 hypoxanthine;
 3-(3-cyclopentyloxy-4-methoxy-benzyl)-8-(1-(4-fluorobenzyloxy)-1-methyl-ethyl)-
 hypoxanthine;
 3-(3-benzyloxy-4-methoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-hypoxanthine;
 3-(3-4-dimethoxy-benzyl)-8-(1-benzyloxy-1-methyl-ethyl)-hypoxanthine;
 3-(3-benzyloxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;

3-(3-hydroxy-4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-4-dimethoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(1,3-benzodioxole-5-methyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(4-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-chloro-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(4-methoxy-benzyl)-8-(1-methyl-ethyl)-hypoxanthine;
3-(3-4-dimethoxy-benzyl)-8-(1-(4-fluorobenzyloxy)-1-methyl-ethyl)-hypoxanthine;
and pharmaceutically acceptable salts thereof.

add
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